

U.S. Application No. 10/539,014
Attorney Docket No. 2003B133D US
Response to Office Action of May 2, 2007
Amendment Dated August 1, 2007

REMARKS

Reconsideration of the above identified application is respectfully requested. Claims 1-88 are in pending in this case.

Amendments to the Specification and Claims

The specification and claims have been amended to recite the triad as an isoolefin-alkylstyrene-isoolefin triad; alternatively referred to as a BSB triad. In several locations of the original specification and claims, the triad was inadvertently referred to as an alkylstyrene-isoolefin-alkylstyrene triad. However, the triad of interest in the present application is the isoolefin-p-alkylstyrene-isoolefin triad. Support for the amendments and for reciting the BSB triad is found in the original specification; specifically in paragraphs [0017], [0018], [00209], [00210], [00211], [00212], [00250], [00251], and Table 26.

New claims 86 to 88 recite a range of alkylstyrene content in the copolymer. Support for the recited range is found in original paragraph [0082].

Applicants submit that NO new matter has been introduced by the above amendments.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 71-83 and 85 stand rejected under 35 U.S.C. § 112, first paragraph for indefiniteness. Specifically, it was unclear in claim 71 as to which element of the claim the drawn structure was related. Claim 71 has been amended to clarify that it is the functionalized or halogenated copolymer that should have the illustrated structure.

It is requested that this rejection be withdrawn.

Rejections over Powers (US 5,162,445)

Claims 1-11 and 84 stand rejected as anticipated under 35 U.S.C. § 102(b) over Powers (US 5,162,445).

Claims 12-64 and 67-70 stand rejected as anticipated under 35 U.S.C. § 102(b) or alternatively, obvious under 35 U.S.C. § 103(a) over Powers.

Claims 71-83 and 85 stand rejected as obvious under 35 U.S.C. § 103(a) over Powers.

U.S. Application No. 10/539,014
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All claims, excluding claims 65 and 66, stand rejected, under one or more statute, over Powers.

For the claims rejected solely as anticipated by Powers, while Powers fails to disclose m values, or the percentage of BSB triads in the disclosed copolymer, it is held that m values for the compounds of example 95 of Powers "would be expected for the disclosed examples at greater than 20 wt% pMS." As discussed in the specification, alkylstyrene units have a preferred tendency to follow each other in a copolymer chain. Thus, for known polymerization reactions in methyl chloride, as disclosed by Powers, as the mol% of pMS in the copolymer increases, the methylstyrene units will have a greater tendency to be adjacent, rather than isolated between isoolefin units in a BSB triad. This results in a typical known distribution ratio for triads in a copolymer.

However, for the present invention, when the copolymer is polymerized in a hydrofluorocarbon, the distribution ratio for functional groups on the copolymer is measurably altered. Based on data presented in the original specification (paragraphs 00250, 00251, and Table 26), the following can be demonstrated: a) for a given ml pMS in the feed stream, the % of BSB triad in the copolymer is greater when polymerized in CH_2FCF_3 versus Powers' polymerization in methyl chloride (Graph 1); b) for a given mol% pMS in the copolymer, the % of BSB triad in the copolymer is greater when polymerized in CH_2FCF_3 versus polymerization in methyl chloride (Graph 2); and c) above a small amount of pMS in feed stream, for a given ml pMS in the feed stream, the copolymer polymerized in CH_2FCF_3 has a lower mol% pMS (Graph 3), however, even for similar incorporation amounts for low pMS in the stream, as seen in Graph 1, the distribution rate for the functional group is different for the different diluents. Thus, the use of a different diluent is affecting the polymerization and the resulting copolymer is measurably different and distinct from the polymerization as disclosed by Powers.

For the claims reciting product-by-process limitations, it is stated in the Office Action that the record contains no evidence of the process producing a product different from that of Powers, and if there is, such a difference would be minor and obvious. Applicants disagree. As shown by the Graphs, polymerization in a different diluent does result in a product with measurable differences. As discussed in present application, one skilled in the art might expect a general pattern of decreasing mol% of BSB with an increased amount of alkylstyrene, one would not expect a higher mol% of BSB in the copolymer that occurred

U.S. Application No. 10/539,014
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Amendment Dated August 1, 2007

with a diluent change. This change in how the alkylstyrene is copolymerized is not appreciated by Powers, not is there any teaching in Powers to suggest thus such a change would be obvious to one skilled in the art.

Regarding the halogenation or functionalization claims held as obvious over Powers, the above statements are also applicable as the halogenation or functionalization of the isooolefin-alkylstyrene copolymer occurs after formation of the copolymer. As Powers fails to anticipate or render obvious the copolymer having a greater mol% BSB, Powers also fails to anticipate or render obvious halogenation or functionalization of the recited copolymer.

It is requested that in light of the above remarks that the rejections of the claims over Powers be reconsidered and withdrawn.

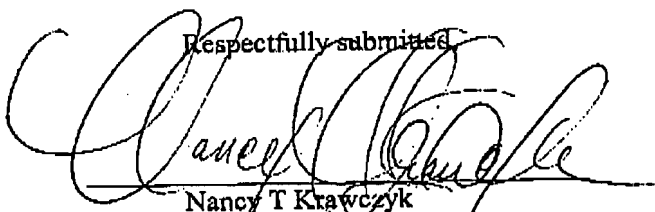
Allowed Subject Matter

Applicants duly note with appreciation the indication of allowable subject matter in claims 65 and 66. However, at this time, Applicants believe that the subject matter as presently set forth in the independent claims are allowable over the noted prior art, and elects, at this time, to not incorporate the indicated allowed subject matter, and any intervening claims, into the independent claims.

In view of the above amendments and remarks it is respectfully submitted that the claims in this case are in condition for allowance. Prompt notice of allowance is respectfully solicited.

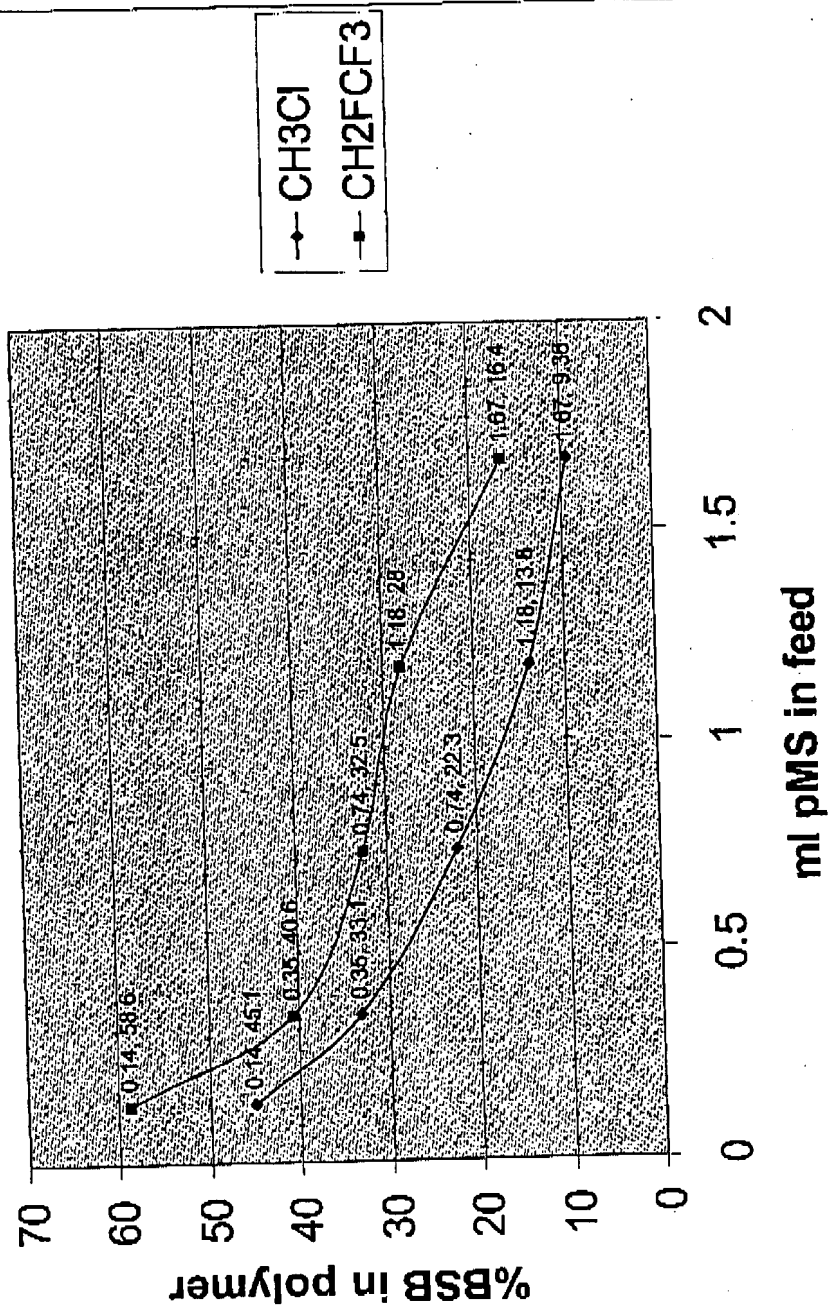
August 1, 2007
Date

Respectfully submitted


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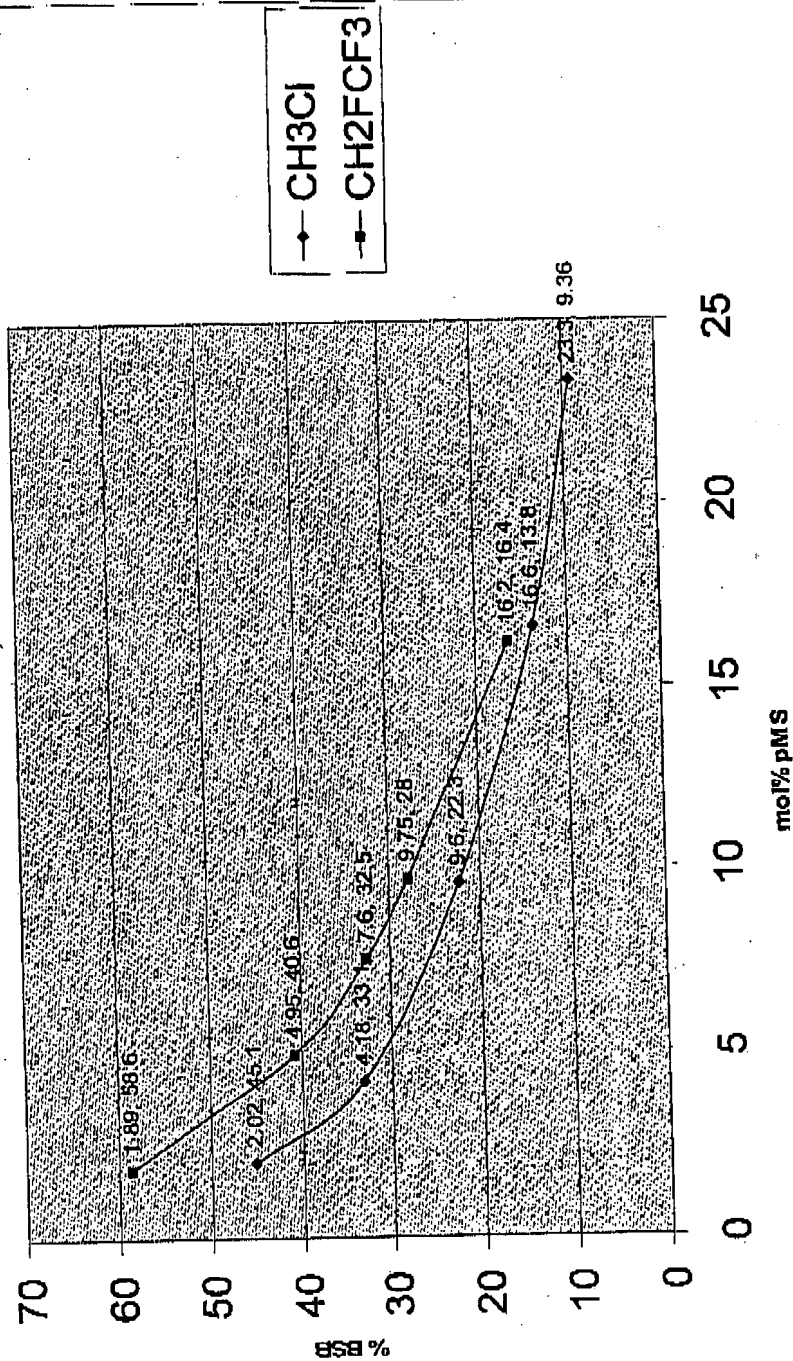
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Graph 1



U.S. Application No. 10/539,014
 Attorney Docket No. 2003B133D US
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Graph 2



Graph 3

